



New virus detected on *Nasturtium officinale* (watercress)

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Nasturtium officinale (watercress) is a semi-aquatic, high value, leaf and stem crop. As a member of the family Brassicaceae (Cruciferae), it has a variety of culinary, medicinal and cosmetic uses. In 2009 watercress samples from Spain were received for virus testing. The leaves had symptoms of vein clearing with the veins appearing white, with chlorotic spotting and distortion (Fig. 1). The prominent, raised leaf veins had led to a number of customer rejections due to undesirable appearance. In severe cases breakdown of the raised vascular system was causing the ingress of opportunistic plant pathogens such as a *Pseudomonas* sp. having a direct effect on the crop shelf life. Overall, the crop was unmarketable.

The sample tested negative by ELISA for known watercress viruses such as *Turnip mosaic virus*, *Tomato aspermy virus*, *Broad bean wilt viruses 1 and 2*, *Cucumber mosaic virus* and *Watercress yellow spot virus* (WYSV). Further testing by sap inoculation followed. Six days after inoculation, local chlorotic spots were noted on *Nicotiana occidentalis* P1 and similarly on *N. benthamiana* after 13 days. No virus reaction was seen on *Chenopodium quinoa*, *C. amaranticolor*, *. hesperis*, *N. clevelandii*, *N. glutinosa*, or *Petunia* sp. This further differentiates the new virus from WYSV which is reported to induce symptoms on *C. quinoa* and *N. clevelandii* (Walsh & Phelps, 1991; Walsh *et al.*, 1989) or *Watercress chlorotic leaf spot virus* which is reported to induce symptoms on *C. quinoa* and *C. amaranticolor* (Tomlinson & Hunt, 1987). A sample of plant material infected with the new virus was then sequenced with a Roche 454 FLX system using the methods described in Adams *et al.*, (2009). Out of 55140 readings obtained, 13122 contained tymovirus-related sequences. From these readings a coat protein sequence was assembled (GenBank Accession No. JN808774) and compared to that of existing viruses. The new virus is a tymovirus related to *Turnip yellow mosaic virus* (TYMV). Fig. 2 shows a neighbour-joining tree of related coat protein sequences constructed using MEGA (Kumar *et al.*, 2008). The coat protein sequence of the new virus is only 82% similar to its closest neighbour, TYMV, and thus constitutes a new viral species according to ICTV guidelines (Fauquet *et al.*, 2005). We propose the tentative name of Watercress white vein virus (WWVV) for this new virus.

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Figure 1

from his growers. This work was funded by the EU-Qbol project. Antisera of WYSV was a gift from John Walsh, University of Warwick, UK.

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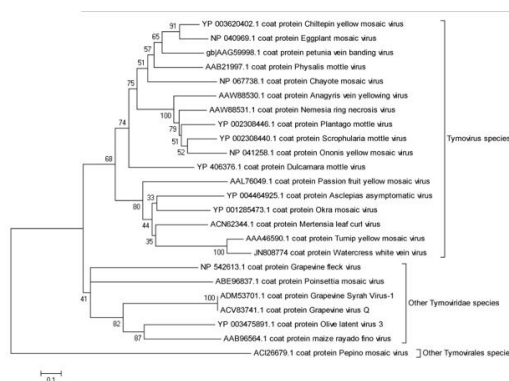


Figure 2

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